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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/003,151	11/02/2001	Denis Morrissey	50959	7421

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EXAMINER

WONG, EDNA

ART UNIT

PAPER NUMBER

1753

DATE MAILED: 07/09/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

10/003,151

Applicant(s)

MORRISSEY ET AL.

Examin r

Edna Wong

Art Unit

1753

-- Th MAILING DATE of this communication appears on the cover sheet with th correspond nc address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18,23 and 24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18,23 and 24 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other:

Claim Rejections - 35 USC § 112

Claims **1-18 and 23-24** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1

line 6, it is unclear what the current is applied to.

Claim 2

line 1, "the two or more acids" lack antecedent basis.

line 2, the alternative expression of the Markush group is improper. MPEP 2173.05(h). The phrase -- the group consisting of -- should be inserted after the word "from".

Claim 3

line 2, the alternative expression of the Markush group is improper. MPEP 2173.05(h). The phrase -- the group consisting of -- should be inserted after the word "from".

Claim 4

line 2, the alternative expression of the Markush group is improper. MPEP

2173.05(h). The phrase -- the group consisting of -- should be inserted after the word "from".

Claim 7

line 2, the alternative expression of the Markush group is improper. MPEP 2173.05(h). The phrase -- the group consisting of -- should be inserted after the word "from".

Claim 9

line 1, it appears that the electroplating bath should further comprise the source of halide ions and not the electrolyte. However, it is unclear if this is. Note that the electrolyte already comprises two acids.

Claim 10

line 3, it is unclear what the current is applied to.

Claim 11

line 1, "the two or more acids" lack antecedent basis.

line 2, the alternative expression of the Markush group is improper. MPEP 2173.05(h). The phrase -- the group consisting of -- should be inserted after the word

"from".

Claim 12

line 2, the alternative expression of the Markush group is improper. MPEP 2173.05(h). The phrase -- the group consisting of -- should be inserted after the word "from".

Claim 13

line 2, the alternative expression of the Markush group is improper. MPEP 2173.05(h). The phrase -- the group consisting of -- should be inserted after the word "from".

Claim 16

line 2, the alternative expression of the Markush group is improper. MPEP 2173.05(h). The phrase -- the group consisting of -- should be inserted after the word "from".

Claim 18

line 1, it appears that the electroplating bath should further comprise the source of halide ions and not the electrolyte. However, it is unclear if this is. Note that the electrolyte already comprises two acids.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

I. Claims **1-18 and 23-24** are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims **10-27** of copending Application No. 09/976,421 (**Morrissey et al.**, Patent Application Publication No. US 2002/0043467 A1).

Although the conflicting claims are not identical, they are not patentably distinct from each other because the claim limitation of "an electroplating bath comprising (a) a source of metal ions, (b) an electrolyte comprising two acids and (c) optionally one or more additives" is common to the claims.

Applicants have taken this limitation and drafted it into independent method claims 1 and 10 in the present invention, and further limited the substrate to have discontinuities and the electroplating bath to have the two acids present in a ratio of 99:1 to 1:99 by weight.

The claims are not patentably distinct from each other because the claims of the present invention fail to be patentably distinct from the inventions claimed in the copending application because the independent claims of the present invention recites limitations that are similar to, either alone or in combination with their dependent claims, the claims of the copending application and vice versa, wherein the claims of the present invention are encompassed by the claims of the copending application. Therefore, the claims would have been an obvious variant over each other.

Furthermore, the two or more acids claimed in the copending application would have inherently been present in a ratio. Although not claimed, it appears that the ratio would have encompassed a ratio of 99:1 to 1:99 by weight, unless proven otherwise.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

II. Claims **1-18 and 23-24** are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims **1-20** of U.S. Patent No. 6,531,046 B2 (**Morrissey et al.**).

Although the conflicting claims are not identical, they are not patentably distinct from each other because the claim limitation of "an electroplating bath comprising (a) a source of metal ions, (b) an electrolyte comprising two acids and (c) optionally one or more additives" is common to the claims.

Applicants have taken this limitation and drafted it into independent method

claims 1 and 10 in the present application, and further limited the electroplating bath to have the two acids present in a ratio of 99:1 to 1:99 by weight.

The claims are not patentably distinct from each other because claims of the present invention fail to be patentably distinct from the inventions claimed in the claims of the patent because the independent claims of the present invention recite limitations that are similar to, either alone or in combination with their dependent claims, the claims of the patent and vice versa, wherein the claims of the present invention are encompassed by the claims of the patent. Therefore, the claims would have been an obvious variant over each other.

Furthermore, the two or more acids claimed in the copending application would have inherently been present in a ratio. Although not claimed, it appears that the ratio would have encompassed a ratio of 99:1 to 1:99 by weight, unless proven otherwise.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

I. Claims **1-18 and 23-24** are rejected under 35 U.S.C. 102(e) as being anticipated

by **Mikkola et al.** (Patent Application Publication No. US 2002/0043468 A1).

Mikkola teaches a method of providing a metal seed layer substantially free of discontinuities disposed on a substrate comprising the steps of:

(i) contacting a metal seed layer having discontinuities disposed on a substrate (page 2, ¶ [0021]) with an electroplating bath comprising;

- (a) a source of metal ions (page 3, ¶ [0027]);
- (b) an electrolyte comprising two acids (page 3, ¶ [0029]); and
- (c) optionally one or more additives (page 3, ¶ [0026]),

wherein the two acids are present in a ratio of 99:1 to 1:99 by weight (page 3, ¶ [0029]); and

(ii) applying a current (page 5, ¶ [0050]).

The two or more acids are selected from organic acids, inorganic acids, and mixtures thereof (page 3, ¶ [0029]).

The organic acids are selected from alkylsulfonic acids, aryl sulfonic acids, carboxylic acids and halogenated acids (page 3, ¶ [0028]).

The inorganic acids are selected from sulfuric acid, phosphoric acid, nitric acid, hydrogen halide acids, sulfamic acid and fluoroboric acid (page 3, ¶ [0028]).

The acids are present in a total amount of from about 1 to about 350 g/L (page 3, ¶ [0030]).

The source of metal ions is a source of copper ions (page 3, ¶ [0027]).

The source of copper ions is selected from copper sulfates, copper acetates,

copper fluoroborate, and cupric nitrates (page 3, ¶ [0027]).

The source of copper ions is present in an amount of from about 1 to about 300 g/L (page 3, ¶ [0027]).

The electrolyte further comprises a source of halide ions (page 3, ¶ [0032]).

The electroplating bath comprises three or more acids (= included in two or more acids) [page 3, ¶ [0029]].

Mikkola also teaches a method of manufacturing an electronic device (page 2, ¶ [0017]).

The applied reference has a common inventor/assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

II. Claims 1-18 and 23-24 are rejected under 35 U.S.C. 102(e) as being anticipated by **Merricks et al.** (Patent Application Publication No. US 2002/0088713 A1).

Merricks teaches a method of providing a metal seed layer substantially free of

discontinuities disposed on a substrate comprising the steps of:

(i) contacting a metal seed layer having discontinuities disposed on a substrate (page 1, ¶ [0011]) with an electroplating bath comprising;

(a) a source of metal ions (page 2, ¶ [0021]);

(b) an electrolyte comprising two acids (page 2, ¶ [0024]); and

(c) optionally one or more additives (page 2, ¶ [0020]),

wherein the two acids are present in a ratio of 99:1 to 1:99 by weight (page 2, ¶ [0025]); and

(ii) applying a current (page , ¶ [00]).

The two or more acids are selected from organic acids, inorganic acids, and mixtures thereof (page 2, ¶ [0023]).

The organic acids are selected from alkylsulfonic acids, aryl sulfonic acids, carboxylic acids and halogenated acids (page 2, ¶ [0023]).

The inorganic acids are selected from sulfuric acid, phosphoric acid, nitric acid, hydrogen halide acids, sulfamic acid and fluoroboric acid (page 2, ¶ [0023]).

The acids are present in a total amount of from about 1 to about 350 g/L (page 2, ¶ [0026]).

The source of metal ions is a source of copper ions (page 2, ¶ [0021]).

The source of copper ions is selected from copper sulfates, copper acetates, copper fluoroborate, and cupric nitrates (page 2, ¶ [0021]).

The source of copper ions is present in an amount of from about 1 to about 300

g/L (page 2, ¶ [0021]).

The electrolyte further comprises a source of halide ions (page 3, ¶ [0028]).

The electroplating bath comprises three or more acids (page 2, ¶ [0024]).

Merricks also teaches a method of manufacturing an electronic device (page 1, ¶ [0012]).

The applied reference has a common inventor/assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims **1-18 and 23-24** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Dahms et al.** (US Patent No. 5,433,840).

Dahms teaches a method of providing a metal seed layer substantially free of discontinuities disposed on a substrate comprising the steps of:

- (i) contacting a substrate (= printed circuits) [col. 1, lines 9-12] with an electroplating bath comprising;
 - (a) a source of metal ions (= copper sulfate) [col. 3, line 67];
 - (b) an electrolyte comprising two acids (sulfuric acid replaced in part by methanesulfonic acid) [col. 4, lines 10-13]; and
 - (c) optionally one or more additives (cols. 2-3, Tables 1-5; and col. 4, lines 18-19); and
- (ii) applying a current (col. 4, lines 24-30).

The two or more acids are selected from organic acids, inorganic acids, and mixtures thereof (= sulfuric acid and methanesulfonic acid) [col. 4, lines 10-13].

The organic acid is an alkylsulfonic acid (= methanesulfonic acid) [col. 4, lines 10-13].

The inorganic acid is sulfuric acid (col. 4, lines 10-13).

The acids are present in a total amount of from about 1 to about 350 g/L (= 180-220 g/liter) [col. 4, line 5].

The source of metal ions is a source of copper ions (= copper sulfate) [col. 3, line 67].

The source of copper ions is selected from copper sulfates, copper acetates,

copper fluoroborate, and cupric nitrates (= copper sulfate) [col. 3, line 67].

The source of copper ions is present in an amount of from about 1 to about 300 g/L (= 20-250 g/liter) [col. 3, line 67].

The electrolyte further comprises a source of halide ions (col. 4, lines 13-17).

The electroplating bath comprises three or more acids (= sulfuric acid, methanesulfonic acid and hydrochloric acid) [col. 4, lines 11-17].

Dahms also teaches a method of manufacturing an electronic device (= strengthening the conductors of printed circuits) [col. 1, lines 9-12].

Dahms does not teach having a metal seed layer having discontinuities disposed on the substrate; and wherein the two acids are present in a ratio of 99:1 to 1:99 by weight.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one skilled in the art would have been motivated to have modified the method of Dahms by having a metal seed layer having discontinuities disposed on the substrate because Dahms teaches strengthening the conductors of printed circuits (col. 1, lines 9-12). It appears that the conductors would have been discontinuous or non-uniform if they need to be strengthened because discontinuous or non-uniform deposition of the conductors would

have led to their weakness, esp., when they need to pass an electrical current.

As to wherein the two acids are present in a ratio of 99:1 to 1:99 by weight, Dahms teaches 180-220 g/liter of sulfuric acid. The sulfuric acid can be replaced entirely or in part by fluoroboric acid, methanesulfonic acid or other acids (col. 4, lines 5-12). The ratio of the two acids is a result-effective variable and one skilled in the art has the skill to calculate the ratio that would determine the success of the desired reaction to occur, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

Citations

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bokisa et al. (US Patent 6,063,172) is cited to teach an electroless plating method wherein the plating bath contains at least one acid (col. 7, lines 7-20).

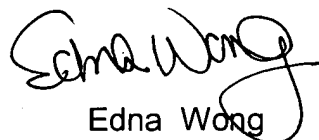
Crosby (Patent Application Publication US 2002/0187355 A1) is cited to teach a method for electroplating tin or tin alloys wherein the electrolyte comprises one or more acidic acids (page 2, ¶ [0022]).

Egli et al. (Patent Application Publication US 2002/0153260 A1) is cited to teach a method for depositing a solderable finish on an electronic device wherein the electroplating composition comprises a mixture of acidic electrolytes (page 3, ¶ [0036]).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (703) 308-3818. The examiner can normally be reached on Mon-Fri 7:30 am to 5:00 pm, alt. Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 873-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1495.



Edna Wong
Primary Examiner
Art Unit 1753

EW
July 9, 2003